

TABLE 1.—*Solar radiation intensities during December 1924—Con.*  
Lincoln, Nebr.

(Gram-calories per minute per square centimeter of normal surface)

Date	8 a.m.	Sun's zenith distance										Noon
		78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
		Air mass										
		A. M.						P. M.				
		e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	
Dec. 1	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
9	3.45	1.01	1.12	1.25				1.22			2.49	
15	1.52										1.96	
19	3.00	0.88	0.97	1.14							4.57	
22	0.63							1.35	1.17		0.64	
	0.96							1.08			1.12	
Means		(0.94)	(1.04)	(1.20)				1.22	(1.17)			
Departures		±0.00	-0.01	-0.03				+0.02	+0.10			

\* Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

(Gram-calories per square centimeter of horizontal surface)

Week beginning—	Average daily radiation					Average daily departure from normal		
	Washington	Madison	Lincoln	Chicago	New York	Washington	Madison	Lincoln
Dec. 3.....	cal. 90	cal. 67	cal. 104	cal. 57	cal. 94	cal. -57	cal. -54	cal. -72
10.....	146	115	157	73	85	+3	-9	-16
17.....	134	148	143	56	87	-9	+21	-31
24 *.....	121	153	168	83	110	-25	+21	-11
Excess or deficiency since first of year on Dec. 31, 1924.....						-6	-7402	+2445

\* For eight days.

## 551. 5°6 (261.1) WEATHER OF NORTH AMERICA AND ADJACENT OCEANS

### NORTH ATLANTIC OCEAN

By F. A. YOUNG

The following table shows the average sea-level pressure for the month at a number of land stations on the coast and islands of the North Atlantic. The readings are for 8 a. m., 75th meridian time, and the departures are only approximate, as the normals were taken from the Pilot Chart and are based on Greenwich mean noon observations, which correspond to those taken at 7 a. m., 75th meridian time.

Stations	Average pressure	Departure
	Inches	Inches
St. Johns, Newfoundland.....	29.70	-0.18
Nantucket.....	30.11	+0.04
Hatteras.....	30.21	+0.06
Key West.....	30.14	+0.05
New Orleans.....	30.19	+0.07
Swan Island.....	29.98	-0.01
Turks Island.....	30.13	+0.10
Bermuda.....	30.28	+0.14
Horta, Azores.....	30.22	+0.11
Lerwick, Shetland Islands.....	29.52	-0.26
Valencia, Ireland.....	29.74	-0.21
London.....	29.99	-0.02

The average pressure at Horta being somewhat above normal, while at Lerwick it was considerably below, denotes that the Azores HIGH and Icelandic LOW were well developed with a steep gradient between the two centers of action. At Horta the barometric readings ranged from 29.64 inches on the 20th to 30.52 inches on the 24th, and at Lerwick from 28.35 inches on the 27th to 30.18 inches on the 21st.

In each month from September to December, 1924, inclusive, the number of days with winds of gale force over the steamer lanes was greater than the normal as shown on the Pilot Chart. The maximum number of stormy days was reached in the month under discussion, when in the region between the 45th and 50th parallels and the 25th and 45th meridians gales were reported on from 12 to 14 days. These conditions are abnormal even for December, which, with the exception of January, is considered the stormiest month of the year over the North Atlantic.

Judging from reports received, the number of days with fog was somewhat less than usual over the Grand Banks; it apparently occurred with about its normal frequency off the American coast and somewhat above in northern European waters, while the steamer lanes were comparatively free. Fog was also reported on two

days in the western part of the Gulf of Mexico, two days off the coast of Portugal, and one day in the vicinity of the Azores.

From the 1st to 3d there were two well-developed disturbances in northern waters; the first central in the vicinity of Newfoundland and the second off the coast of northern Europe. The storm area of the western Low extended as far south as the 35th parallel, while on the 1st and 2d the eastern disturbance was restricted to the region between the 45th and 50th parallels and the 15th and 25th meridians. According to reports received this latter storm was intermittent in character, with a period of comparatively moderate weather between the heavy winds occurring at the time of observation on the 1st and 2d, and was recorded by some observers as two separate gales. On the 1st winds of gale force were also reported by vessels about midway between these two lows. On the 4th the western disturbance was central near 50° N., 35° W.; it moved rapidly eastward and on the 5th was near 50° N., 20° W. On both dates strong westerly gales prevailed in the southerly quadrants.

On the 5th St. Johns, Newfoundland, was near the center of another depression, that by the 7th was central near 45° N., 40° W.; it then apparently curved sharply northeastward, although the position on the 8th was uncertain, due to lack of observations.

On the 5th and 6th the trade winds were unusually well developed over the region between the Canal Zone and Jamaica, as shown by storm report in table.

On the 9th a depression covered the province of Quebec; this moved eastward increasing in intensity, and on the 11th the center was near 50° N., 35° W., and by the 12th about 15° west of the coast of Scotland. Moderate to strong gales prevailed on both of these dates in mid-ocean, and on the 12th southerly winds of gale force were also reported in the easterly quadrants.

From the 13th to 15th a deep and slowly moving depression was off the American coast, which during that period was swept by strong westerly gales from Hatteras to Newfoundland; on the 16th the depression began to move rapidly eastward, reaching European waters by the 18th.

From the 14th to 16th there was a well-developed disturbance over the eastern section of the steamer lanes that reached its greatest intensity on the 15th.

On the 18th St. Johns, Newfoundland, was again near the center of a low and moderate gales were reported from vessels between the 30th and 40th parallels and 50th and 55th meridians. On the 19th heavy weather

prevailed over the greater part of the region between the 35th and 55th parallels and the 20th and 45th meridians.

On the 20th there were two well-developed depressions over the ocean; the first in the vicinity of Nova Scotia and the second near 55° N., 25° W. The general conditions were not unlike that of the 19th, except that on the 20th moderate gales were reported from vessels between the Bermudas and Canadian coast.

On the 19th and 20th there was a strong "norther" in the Gulf of Mexico, due to the steep gradient shown on the daily weather map of the 20th, with a barometric reading at Galveston of 30.54 inches and at Swan Island 29.98 inches.

Charts VIII to XIV cover the period from the 21st-27th, inclusive, and an examination of these maps together with the table of Ocean Gale and Storm reports will give a good idea of the very unusual conditions that existed during this period.

On the 27th at Greenwich mean noon the barometric reading at Reykjavik, Iceland, was approximately 27.79 inches, and at Horta, Azores, 30.22 inches. The steep gradient between the Azores HIGH and Iceland LOW continued for the remainder of the month, and in consequence the steamer lanes were swept by unusually severe westerly gales.

## OCEAN GALE AND STORM REPORTS, DECEMBER, 1924

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer (ins.)	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From--	To--	Latitude	Longitude									
North Atlantic Ocean													
Asia, Fr. S. S.	Gibraltar	New York	37 30 N.	06 15 W.	Nov. 30	1st	21	28.57	NW	W	SW	10	Steady W.
Baron Sempill, Br. S. S.	Fowey, England.	Boston	47 24 N.	40 05 W.	1st	8 p., 1st	2d	29.83	WSW	WSW, 10	WSW	11	Steady WSW.
Wellfield, Br. S. S.	Rotterdam	New York	49 42 N.	11 10 W.	1st	11 a., 1st	1st	28.92	SW	W, 5	NW	9	SW-W-NW.
Do.	do.	do.	49 33 N.	15 50 W.	2d	7 a., 2d	2d	29.03	SW	W, 8	NW	10	SW-W-NW.
Meltonian, Br. S. S.	Liverpool	Boston	49 30 N.	30 30 W.	4th	10 a., 4th	5th	29.14	W	SW, 8	W	10	W-SW.
Canadian Prospector, Br. S. S.	Panama	do.	13 04 N.	77 29 W.	5th	Noon, 5th	6th	29.90	E	E, 7	ENE	8	E-NE-E.
Chicago, Fr. S. S.	Vigo	New York	44 37 N.	40 38 W.	5th	2 a., 6th	6th	29.58	S	S	N	11	WNW, 11.
Bellatrix, Du. S. S.	Montreal	Naples	45 33 N.	42 50 W.	9th	3 p., 10th	12th	29.52	S	SW, 7	NW	9	SW-W.
West Quechee, Am. S. S.	Manchester	Philadelphia	35 50 N.	67 10 W.	13th	11 p., 13th	15th	29.54	SSW	SSW, 10	NW	10	SSW-W-SW.
American Banker, Am. S. S.	London	New York	42 58 N.	53 03 W.	14th	7 a., 14th	17th	29.47	W	W, 7	W	11	Steady W.
Breedijk, Du. S. S.	Norfolk	Rotterdam	48 20 N.	24 45 W.	13th	7 p., 14th	16th	29.60	SSE	WSW, 10	NNW	10	WSW-W.
Emanuel Nobel, Belg. S. S.	Rouen	Marcus Hook	50 30 N.	22 10 W.	17th	11 p., 17th	18th	29.44	S	SW, 10	W	11	S-SW-W.
F. H. Hillman, Am. S. S.	Panama	England	31 41 N.	41 07 W.	18th	4 a., 20th	20th	29.85	SW	WNW	WNW	10	Steady WNW.
Gedania, Danzig S. S.	Tampico	Baltimore	21 35 N.	95 50 W.	19th	Mid., 19th	20th	30.12	N	N, 10	NNW	10	E-N-NW-N.
Bidwell, Am. M. S.	Denmark	Marcus Hook	58 07 N.	21 56 W.	20th	3 a., 20th	20th	29.10	SE	SSE, 9	SSW	9	SSE-SE.
Ampetco, Belg. S. S.	Antwerp	Paulsboro, Pa.	48 44 N.	32 08 W.	17th	2 p., 21st	26th	29.56	SW	WNW, 12	WNW	12	SSE-WNW.
Malne, Dan. S. S.	Newcastle	Miami, Fla.	41 45 N.	35 56 W.	21st	11 a., 21st	23d	29.35	WSW	WSW, 10	NNW	12	WSW-WNW.
Emanuel Nobel, Belg. S. S.	Rouen	Marcus Hook	48 43 N.	39 00 W.	21st	5 a., 22d	24th	29.12	S	W, 12	NW	12	S-W-NW.
Parthenia, Br. S. S.	Glasgow	St. John, N. B.	54 34 N.	19 16 W.	20th	Noon, 22d	23d	28.77	SW	S, 11	WSW	11	S-SW.
Bidwell, Am. M. S.	Denmark	Marcus Hook	48 40 N.	41 05 W.	24th	3 a., 26th	28th	29.20	NW	W, 7	W	11	SSW-W-SW-WNW.
Nubian, Br. S. S.	Boston	Liverpool	45 27 N.	41 02 W.	25th	8 a., 26th	27th	29.60	SW	WSW, 8	W	12	SW-W-SW-NW.
Eemdiik, Du. S. S.	Cristobal	do.	50 49 N.	10 24 W.	19th	4 p., 27th	27th	29.08	SW	WSW, 8	WSW	11	Steady WSW.
Olfield, Br. S. S.	France	Halifax, N. S.	50 00 N.	13 00 W.	29th	7 p., 29th	30th	29.39	SW	WNW, 10	W	10	SSW-WNW.
Clavarak, Am. S. S.	Mobile	Rotterdam	41 35 N.	41 55 W.	28th	4 a., 29th	30th	29.86	N	N, 5	NW	9	W-NW-N.
Bljendijk, Du. S. S.	Rotterdam	Boston	49 37 N.	20 25 W.	30th	4 p., 30th	31st	29.50	WSW	W, 9	WSW	9	W-SW-W.
Devonian, Br. S. S.	Liverpool	Halifax, N. S.	50 57 N.	25 05 W.	31st	10 p., 31st	Jan. 1	28.98	SSW	W, 8	W	9	SW-W.
North Pacific Ocean													
Eburna, Br. S. S.	Borneo	Yokohama	20 20 N.	122 15 E.	Nov. 30	10 p., 30th	Dec. 2	29.88	NE	NE, 8	ENE	10	Steady.
Tahchee, Br. S. S.	San Francisco	Manila	29 45 N.	176 30 W.	Dec. 2	7 a., 2d	2d	29.80	SSW	SSW, 8	SW	8	SSE-E-NE.
Pres. Cleveland, Am. S. S.	Manila	Yokohama	18 14 N.	117 44 E.	3d	Noon, 3d	4th	29.56	S	S, 6	N	10	W by S-W.
Montgomery City, Am. S. S.	San Pedro	do.	31 32 N.	177 44 E.	5th	2.30 p., 5th	6th	29.64	WSW	WSW	WNW	8	SSW-W-NW.
West Cayote, Am. S. S.	Portland, Oreg.	do.	45 00 N.	155 00 E.	5th	1 p., 5th	6th	29.64	SSW	NW, 8	WNW	9	SSW-W-NW.
West Ivan, Am. S. S.	Hongkong	San Francisco	34 48 N.	175 48 W.	6th	1 p., 6th	6th	29.51	SW	SW, 8	WSW	8	SW-WSW.
Tamaba, Br. S. S.	Shanghai	do.	37 40 N.	149 20 E.	8th	1 p., 8th	10th	29.58	ESE	S	N	10	SE-S-SW.
West Cayote, Am. S. S.	Portland	Yokohama	40 15 N.	145 E.	8th	4 p., 8th	9th	29.65	SE	NW, 9	NNW	10	SE-E-NW.
West Ivan, Am. S. S.	Hongkong	San Francisco	35 N.	161 W.	10th	5 a., 10th	11th	29.91	SW	SW, 10	SW	10	S-SW.
Dickenson, Am. S. S.	Honolulu	Midway Is.	25 53 N.	174 13 W.	9th	7 p., 9th	10th	29.54	SW	SW, 9	NW	9	SW-WNW.
Eastern Prince, Br. S. S.	Panama	Yokohama	22 22 N.	161 W.	11th	4 p., 11th	11th	29.79	SW	NW, 8	NW	9	SW-W-NW.
Memphis, City, Am. S. S.	San Pedro	do.	33 45 N.	141 E.	11th	8 p., 11th	12th	29.49	W	W, 6	W	11	W-NW-W.
Montgomery City, Am. S. S.	do.	do.	31 10 N.	149 E.	12th	Mid., 12th	14th	29.61	WSW	SW, 10	NW	10	WSW-W.
Yokohama Maru, Jap. S. S.	Yokohama	Victoria	49 25 N.	173 20 W.	12th	1 a., 14th	14th	29.41	S	S, 10	SW	11	SSE-S-SW.
Pres. Madison, Am. S. S.	Seattle	Yokohama	51 55 N.	165 07 W.	14th	10 p., 14th	14th	29.85	S by E	SSW, 7	SSW	10	SSE-S-SW.
Eldridge, Am. S. S.	Manila	Seattle	49 15 N.	173 30 E.	17th	11 p., 17th	19th	29.00	E	ENE, 7	SSW	11	SE-SSW.
Tamaba, Br. S. S.	Shanghai	San Francisco	40 12 N.	145 45 W.	19th	1 p., 21st	21st	29.42	E	E, 8	S	9	E-SE-S.
Emp. of Aus., Br. S. S.	Yokohama	Victoria	50 30 N.	148 15 W.	21st	8 a., 22d	22d	29.97	ENE	ESE, 9	E by S	9	E-ESE-E.
Pomona, Am. S. S.	Everett	Balboa	15 30 N.	96 W.	21st	2 p., 21st	22d	29.97	ENE	N, 8	N	8	E-NE-N.
Harold Dollar, Br. S. S.	San Pedro	Japan	32 58 N.	161 25 E.	22d	2 p., 22d	23d	29.56	NW	NW, 9	WNW	11	SW-WNW.
Pres. Harrison, Am. S. S.	Honolulu	Kobe	33 30 N.	159 40 E.	22d	10 p., 22d	23d	29.38	SE	N, 12	NW	12	SE-N.
West Cajoot, Am. S. S.	Hongkong	San Francisco	38 25 N.	175 E.	23d	10 a., 23d	24th	29.95	NE	N, 10	NW	10	NE-N.
West Jena, Am. S. S.	Portland	Yokohama	34 55 N.	154 30 E.	24th	10 a., 24th	25th	29.45	NW	NW, 6	NW	10	Steady.
Ibukisan Maru, Jap. S. S.	Yokohama	San Francisco	47 05 N.	180 W.	25th	4 p., 27th	27th	28.56	N	NNE, 6	NNE	8	NNE-N.
West Cajoot, Am. S. S.	Hongkong	do.	38 20 N.	171 45 W.	26th	4 a., 26th	26th	28.65	SW	SW, 8	SW	9	Steady.
Stockton, Am. S. S.	Cebu	Portland	21 35 N.	132 10 E.	26th	11 p., 26th	27th	29.82	NW	NW, 10	N	10	NW-W.
Havre Maru, Jap. S. S.	Japan	Grays Harbor	42 20 N.	172 11 E.	28th	11 p., 27th	28th	28.86	N by W	NW by N	WNW	9	NW-W-WNW.
Pres. Jefferson, Am. S. S.	Yokohama	Seattle	48 20 N.	177 E.	30th	10 a., 30th	30th	28.94	NW	W, 9	WNW	9	NW-W-WNW.
Ibukisan Maru, Jap. S. S.	do.	San Francisco	47 45 N.	165 20 W.	29th	6 p., 29th	31st	28.46	NE	N, 7	SW	9	N-NW-W.
Anna E. Morse, Am. S. S.	do.	Portland	46 35 N.	153 W.	29th	1 a., 30th	Jan. 2	28.79	S	SSW, 8	WSW	10	SSW-W.